

REMARKS

Claims 1 - 8 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1 and 3 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Broadbent, Jr. et al. (U.S. Pat. No. 4,555,798). This rejection is respectfully traversed.

Claim 1 has been amended and rewritten. Claim 1 now calls for the examination to be conducted by imaging with an imaging focal point of the sensor camera being shifted away from a surface of the work piece at a distance greater than a focal length of the sensor camera. This subject matter is described, for example, at paragraph [0018] and Figures 1(1) and 1(2) of the application. Specifically, at paragraph [0018] it states:

“When an image is photographed, in accordance with the present embodiment, the position of the focal point of the line sensor camera 14 is not concurred on the surface of the work piece 10, but is set at a position shifted from the surface of the work piece. In other words, the line sensor camera 14 is positioned at a distance $(L+\alpha)$ from the through hole of the work piece 10, which is longer than a focal length L , in order to apparently expand the area of the photographed image of the passing light. An illustration of the principle is shown in Fig. 1, and a comparison example is shown in Fig. 2.” (emphasis added)

Broadbent does not disclose such a method. That is, Broadbent does not disclose imaging with an imaging focal point of the sensor camera being shifted away from a surface of the work piece at a distance greater than a focal length of the sensor camera. Since Broadbent is silent with respect to this aspect of the present invention, the claimed invention is not anticipated.

Claim 3 is dependent on claim 1, addressed above. Claim 3 is not anticipated for at least the same reasons.

Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 2, 4 - 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Broadbent, Jr. et al. (U.S. Pat. No. 4,555,798) in view of Onishi et al. (U.S. Pat. No. 5,347,591). This rejection is respectfully traversed.

Independent claims 2, 5, and 6 have also been amended to call for imaging with an imaging focal point of the sensor camera being shifted away from a surface of the work piece at a distance greater than a focal length of the sensor camera. As stated above, Broadbent is completely silent with respect to this aspect of the claimed invention. Onishi is also silent with respect to this aspect of the claimed invention. Since both Broadbent and Onishi are silent with respect to this aspect of the claimed invention, the claimed invention would not have been obvious.

Further, there is no suggestion or motivation in either Broadbent or Onishi to modify their methods to include the a step of imaging with an imaging focal point of the

sensor camera being shifted away from a surface of the work piece at a distance greater than a focal length of the sensor camera. Notwithstanding, the Examiner alleges that it is well known in the art of inspection to move the camera in a Z direction (i.e., up and down to change magnification) to increase the clarity of the images obtained. Applicants, however, respectfully assert that this position teaches away from the claimed invention.

More specifically, an aspect of the claimed invention is to *decrease* the focus and clarity. Referring again to paragraph [0018] of the application, it states:

“However, in accordance with the embodiment of the present invention, as shown in Fig. 1(1), a Z-axis adjusting device of the camera, such as a close-up photographing ring is adjusted, such that the focal point is located at a position above the surface of the work piece 10 (toward the sensor side). In the photographed image under a focused condition, a region in which the passing light is blocked by a foreign matter in the through hole is detected as an area of, for example, two pixels as shown in Fig. 2(2). In contrast, in accordance with an embodiment of the present invention, as shown in Fig. 1(2), the region can be detected as an area of 8 pixels. In other words, under the focused condition, only the light passing through the opening section of the through hole is detected. However, under an out-of-focus condition in accordance with the embodiment of the present invention, although the light intensity per unit area reduces, an area of a photographed image of the light passed through the through hole is enlarged and, in a similar manner, an area corresponding to the foreign matter is apparently enlarged.” (emphasis added)

As described above, an important aspect of the claimed invention is to increase the area of the photographed image. This is accomplished by imaging with an imaging focal point of the sensor camera being shifted away from a surface of the work piece at a distance greater than a focal length of the sensor camera, as claimed. Since neither Broadbent, Onishi, nor any combination thereof teaches, suggests, or provides motivation to utilize such a method, the claimed invention would not have been obvious.

With respect to claims 4, 7, and 8, these claims are dependent on independent claims 1, 2, 5, and 6, addressed above. These claims are not obvious for at least the same reasons.

Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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